I-INTERNATIONAL MEETING OF ANIMAL SCIENCE IN SEMI-ARID REGIONS
Universidade Federal do Agreste de Pernambuco – UFAPE
July 03rd to 05th, 2024, Garanhuns-PE

Nutrition and production of non-ruminants

Effect of incubation temperature on the development of quail chicks

Marisa S. Bastos*[1], Angélica de S. Khatlab [2], Marcos Adriano P. Barbosa[2], Thaís P. Santana[3], Eliane Gasparino[2], Ana Paula Del Vesco[3]
[1]Universidade Federal de Alagoas, Arapiraca/Alagoas, Brasil; [2]Universidade Estadual de Maringá, Maringá/Paraná, Brasil; [3]Universidade Federal de Sergipe, São Cristóvão/Sergipe, Brasil. * marisa.bastos@arapiraca.ufal.br

The production of viable and good quality chicks depends on factors such as genetics and environmental conditions. As the bird embryo is poikilothermic, severe changes in incubation temperature can affect the metabolic rate and physiological development, with the possibility of negative consequences on the post-hatch development of chicks. The recommended incubation temperature for adequate embryonic development of quails is 37.5 °C. However, it is reported that an increase of up to 1 degree above the recommended incubation temperature can accelerate the growth and muscle development of chicks. Therefore, this study was conducted to evaluate the effect of incubation temperature on the development of quail chicks. To this end, 300 quail eggs (*Coturnix coturnix japonica*) were incubated in two incubators (Model Luna 240 - Chocmaster®) programmed to be at different temperatures: 37.5 °C (control incubator – CTL, n = 150) and 39 °C (high temperature incubator – HT, n = 150). The relative humidity of the two incubators was maintained at 60% and the egg rolling system occurred automatically every two hours. On the 15th day of incubation, 12 eggs from each incubator were randomly collected, weighed, and subsequently opened to remove the embryos. The yolk sac was removed from the embryo and weighed to estimate the use of the residual yolk sac and then the embryo was weighed. To evaluate the effect of incubation temperature on post-hatching chicks, shortly after birth, 60 healthy chicks from eggs incubated in both treatments were weighed, identified, and distributed into two groups according to incubation temperature. The animals were raised conventionally and had free access to water and food, formulated to meet the nutritional requirements of this initial phase (1-15 days). At 15 days of age, animals from both groups (HT and CTL) were weighed to evaluate performance. The effect of treatments (HT and CTL) was tested using ANOVA (SAS, 2002 version 9.00, SAS Inst. Inc., Cary, NC) using the F test with a 5% level of significance. No significant differences were observed between treatments on embryo weight (P = 0.0172), birth weight (P = 0.6520) and weight at 15 days (P = 0.9009). However, a significant difference was observed for the weight of the residual yolk sac (P = 0.0092). Chicks from eggs incubated at CTL temperature had a higher percentage of residual yolk sac than animals incubated at HT (32.81 *vs* 25.46%). This indicates that the embryos incubated at high temperatures required greater nutritional input to ensure adequate development in the face of the thermal challenge, however, without long-term consequences since, at 15 days of age, the chicks did not show a significant difference in weight. Thus, we conclude that an increase of 1.5 °C in the recommended incubation temperature (37.5 °C) does not compromise the embryonic and post-hatch development of laying quail chicks.

Key words: embryogenesis, eggs, hatching, nutritional input, poultry production

Financial support: CNPq (Project N° 403205/2021-2)